

REMARKS

Claims 1 and 4-12 remain pending in the present application. No claim amendments have been made. Reconsideration of the application in view of the following comments is respectfully requested.

Rejections under 35 U.S.C. 103(a)

Malik et al. (6,133,412) in view of Malik et al. (SPIE Vol. 3678)

Claims 1 and 4-11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Malik et al. (6,133,412) in view of Malik et al. (SPIE Vol. 3678, 1999). The Examiner contends that the use of naphthyl groups for reducing volatility and contamination of the optics as well as improving etch resistance as taught by Malik et al. (SPIE) to form part of the mixture of Malik et al. (6,133,412) would have been *prima facie* obvious.

Claim 1 recites that “the component (A) is a mixture of a polymer, which comprises the structural units (a1), and in which a portion of hydroxyl groups of said structural units (a1) are protected with the acid dissociable, dissolution inhibiting groups, and a copolymer, which comprises the structural units (a1) and the structural units (a2), and in which a portion of hydroxyl groups of the structural units (a1) are protected with the acid dissociable, dissolution inhibiting groups.” (Emphasis added). By adopting the feature of a mixture of the recited polymer and copolymer, the claimed resist composition can achieve the unexpected advantages described in the specification at page 9, lines 15-16. In particular, “the shape of the formed resist pattern exhibits favorable rectangularity, and a superior isolated line pattern can be obtained.”

In contrast to the invention recited in Claim 1, Malik et al (6,133,412) or Malik et al (SPIE Vol. 3678) only recite a copolymer, and neither of these references teaches or suggests, alone or in combination, a mixture of a polymer and a copolymer, or the unexpected effects obtained with a resist composition comprising these components. Thus, even if a *prima facie* showing of obviousness was established, these unexpected results, in addition to those described below, would overcome any such showing.

Malik et al. (6,133,412) in view of Malik et al. (SPIE Vol. 3678, 1999) further in view of Pasini et al. (SPIE 3676, 1999).

Claim 12 was rejected under 35 U.S.C. 103(a) as being unpatentable over Malik et al. (6,133,412) in view of Malik et al. (SPIE Vol. 3678, 1999) “further in view of [sic]. Although no reference appears after “further in view of”, it is assumed that the Examiner intended to insert “Pasini et al., SPIE Vol. 3678, 1999” and “Hein et al., SPIE 4345, 2001” after this phrase since Pasini et al. and Hein et al. are mentioned at pages 4-5 of the Office Action..

Although acid dissociable, dissolution inhibiting groups recited in Malik et al (6,133,412) and Malik et al (SPIE Vol. 3678) include acetal., the adamantyl groups recited in Pasini et al (SPIE Vol. 3678) do not constitute acetal groups. An acid dissociable, dissolution inhibiting group in tert-butylmethacrylate recited in Hein et al (SPIN Vol. 4345) is tert-butyl. Even if this tert-butyl were replaced by adamantyl groups, acetal could not be produced. Therefore, the combination of Malik et al (6,133,412) and Malik et al (SPIE Vol. 3678), and Pasini et al (SPIE Vol. 3678) and Hien et al (SPIN Vol. 4345) would not result in the composition recited in claim 12.

Unexpected results

In paragraph 3, page 5 of the Office Action, the Examiner alleges that “applicants argue that they have unexpected results to show unobviousness but present no evidence to support such allegations.” This is incorrect. The evidence that supports the showing of unexpected results includes the favorable rectangularity and superior isolated line pattern discussed above, as well as the following:

Examples 7-10, where mixed resins are used as recited in claim 1, resulting in rectangular cross-sectional shape of resist pattern and no pattern collapse (Example 7) and an excellent level of etching resistance (Examples 8-10).

Examples 1, 2, 5 and 6, where single (not mixed) resins and protection by adamantyl groups are used (claim 12), resulting in excellent resolution, rectangular cross-sectional shape of the resist pattern and no pattern collapse (Example 1); and an excellent level of etching resistance (Examples 2, 5 and 6).

Comparative Example 1 uses a resin protected by 1-ethoxyethyl groups which is not encompassed by the present claims, resulting in an inferior etching resistance to that observed in

Examples 1-10.

Thus, Examples 7-10 and Examples 1, 2, 5 and 6 indicate a much improved level of etching resistance in comparison to Comparative Example 1 and Examples 3-4. That is, the constituent features that "The component (A) is a mixture of a polymer and a copolymer (present claim 1)." and "The acid dissociable, dissolution inhibiting groups have adamantyl groups (present claim 12)" result in a positive resist composition that has unexpected, advantageous properties.

In view of the claim amendments and comments presented above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. §103(a).

CONCLUSION

In view of the foregoing amendments and comments, it is respectfully submitted that the present application is fully in condition for allowance, and such action is earnestly solicited. If any minor issues remain which could be resolved by telephone, the Examiner is invited to contact the undersigned at the number provided below.

Respectfully submitted,

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